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B.A.N.Z.
ANTARCTIC RESEARCH EXPEDITION

1929-1931

UNDER THE COMMAND OF SIR DOUGLAS MAWSON, Kt., O.B.E., B.E., D.Sc., F.R.S.

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VOLUME VIII

PART 3

ROTIFERA

By

C. R. RUSSELL

ADELAIDE

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PART 3

ROTIFERA

By

C. R. RUSSELL

[B.A.N.Z.A.R.E. Reports, Series B, Vol. VIII, Part 3, pp. 81-88, text figure 1]

Issued November, 1959

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ROTIFERA

By

C. R. RUSSELL

Canterbury Museum, Christchurch, New Zealand

(One Figure)

Submitted for publication, July, 1958.

INTRODUCTION.

This Report lists thirteen species of the Rotatoria collected by the Expedition including one species of the Order Flosculariacea, and twelve ploimates, one of which is new to science. Many bdelloidal rotifers were also found in the collections but owing to their contracted state they could not be identified. Many of the habitats from which collections were made favoured the bdelloids more than the ploimates; the fact that twelve ploimate species were found indicates, for the first time, that ploimate rotifers are well established in the Antarctic.

At various times it has been suggested that bdelloidal rotifers only existed in the Antarctic and this has been due to the influence of the Report of the British Antarctic Expedition of 1907-9. The late James Murray who was an authority on the bdelloids, accompanied that Expedition, and in his Report he suggested that the presence of the only two ploimates that he collected (together with many bdelloids) was due to the eggs having been transported to the Antarctic by the Scott Expedition of 1901. From a study of Murray's Report it is evident that a large majority of his collections were made from habitats in which ploimate rotifers were unlikely to occur. The work of the present Expedition makes it clear that ploimates may be just as plentiful in the Antarctic as the bdelloids.

I would like to express my thanks to Sir Douglas Mawson for the opportunity to examine the Rotatoria collected by the Expedition which has proved an interesting and valuable study.

LIST OF SPECIES IDENTIFIED.

Cephalodella catellina (Muller).
Cephalodella sp.?
Colurella adriatica Ehrenberg.
Colurella colurus (Ehrenberg).
Filinia maior (Colditz).
Keratella sancta Russell.
Lecane mawsoni n. sp.

Lepadella acuminata (Ehrenberg).
Lepadella elliptica Wulfert.
Lepadella patella (Muller).
Lophocharis oxysternon (Gosse).
Notommata cyrtopus Gosse.
Trichocerca bidens (Lucks).

BDELLOIDS.

As previously stated none of the bdelloidal rotifers could be identified owing to their contracted condition, but many of them belonged to the genera *Adineta* and *Philodina*.

COLLECTING STATIONS CONCERNED IN THIS REPORT.

(As several collections were made at some stations, numbers of the collections have been included in the list.)

Station No.	Collection or Res. No.	Location
54	Res. 62, 89	Slime from stream at Greenland Harbour, Kerguelen.
56B	Res. 39	Sample from damp vegetation, Observatory Bay, Kerguelen.
61	Coll. 949	Orange encrustations on damp rock near shore, Antares Island, Kerguelen.
61	Coll. 950	Dried slime under damp vegetation near stream on Antares Island, Kerguelen.
61	Coll. 953	Aquatic plant material from lakelet, Antares Island, Kerguelen.
61	Coll. 960	From Southern part of Antares Island, Kerguelen.
82	Res. 125	From boggy creek, Lusitania Bay, Macquarie Island.
108	Res. 190	From frozen tarn by shore, near Cape Bruce, MacRobertson Land.

ASSOCIATIONS.

As the extent to which the collections have been separated is not known, associations refer only to the material which has been examined. In the samples the only association of the rotifers was with specimens of the Tardigrada, and they were found in almost every bottle. Several species of these animals were thought to be present: the specimens being in an excellent state of preservation.*

DESCRIPTIONS OF SPECIES.

Included in the systematic list of rotifers are taxonomic notes giving dimensions, details, and variations from type. In most cases the measurements given are averages of several specimens as there is a tendency for specimens which have been preserved in alcohol to become slightly distorted when moved to water, or glycerine and water, for examination.

Short titles only have been given to references, as the older references may all be obtained from Harring's "Synopsis of the Rotatoria", Bulletin 81, Smithsonian Institute, Washington. Later titles, up to 1956 are now obtainable from Voigt's "Die Radertiere Mitteleuropas", Berlin, 1956, the latest, and the standard work on the Rotifera.

The classification of the Rotifera is still a matter of debate between rotifer systematists, although Remane's system is gaining ground in spite of some objections to his grouping. For this reason and for ease of reference all species have been listed in alphabetical order of genera: a practice adopted in many systematic papers.

CEPHALODELLA CATELLINA (Muller).

Cercaria catellina Muller, 1786. Anim. Infus, p. 130, pl. 20, figs. 12 and 13.
Station 61, Coll. 960 (rare).

NOTES. Length of body 100 microns, length of toes 16 microns. Specimens typical but slightly smaller than found in temperate zones.

CEPHALODELLA sp. ?

Station 82 (rare).

NOTES. The integument is thin and flexible and the animal in a contracted condition is short, circular in cross section, and without head section. The posterior of the body is rounded and terminates in a short conical foot with two long sabre shaped recurved toes greater in length than the contracted animal. The ganglion is normal with, apparently, an eyespot although the colour has faded. The mastax is virgate and similar to that of *C. hoodi*. It is considered that the specimen is a contracted form of one of the more flexible species of *Cephalodella*; which species it is impossible to say. Length of contracted body 64 microns. Maximum width 84 microns. Length of toes 70 microns.

COLURELLA ADRIATICA Ehrenberg.

Colurella adriatica Ehrenberg, 1831. Hemprich and Ehrenberg, Symb. Phys. not paged.
Station 61, Coll. 949. Station 56B (common).

NOTES. Length of body 100-110 microns. Length of toes 25-35 microns. The marine type of this species was the only one found.

COLURELLA COLURUS (Ehrenberg).

Monura colurus Ehrenberg, 1830. Abh. Akad. Wiss. Berlin, p. 44.
Station 54, Res. 62, 89.

NOTES. Length of body 90 microns. Length of toe 30 microns. Typical specimens accompanied by specimens (in Collection R. 62) having a smaller depth of body.

FILINIA MAIOR (Colditz).

Triarthra terminalis var. *maior* Colditz, 1914. Zeit. f. Wiss Zool., Bd. 108, pp. 519-630.
Station 56B (not common).

NOTES. Length of body 110 microns. Length of anterior setae 270 and 290 microns. Length of posterior seta 200 microns. This is generally a lacustrine species but appears in brackish water. The animals were probably washed into the vegetation where they were found. Typical specimens.

* All except the last (Res. 90) of the collections listed above contained several animals other than rotifers. The groups were sorted out, but as tardigrades were very plentiful all were not removed from the rotifers. Groups usually present in these collections were nematodes, oligochaetes, copepods, and tardigrades; mites and insect larvae were sometimes present. These groups will be discussed and species identified in other reports in this series. Ed.

KERATELLA SANCTA Russell.

Keratella sancta Russell, 1944. Jour. Royal Micr. Society, vol. LXIV, pp. 121-3.

Station 61, Coll. 960. Antares Island (not common).

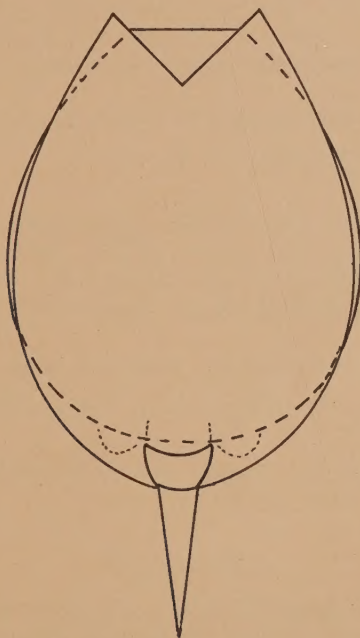
NOTES. Length of body 120 microns. Maximum width 90 microns. Length of anterior spines: lateral and intermediate 16 microns; median 24 microns. Length of posterior spines 10 microns. The specimens are similar to the type except in slight differences in the measurements, and in heavier pustulation of the dorsal plate. This species has until now been considered endemic to the South Island of New Zealand where it is found in brackish and fresh waters.

LECANE (MONOSTYLA) MAWSONI n. sp.

(Fig. 1)

Station 56B, and Station 54, Res. 62.

The outline of the body is broadly ovate, and the depth of the body is nearly three-quarters of its length. The anterior dorsal margin is straight to very slightly concave. The ventral anterior margin has a sharp V sinus which is approximately one-sixth of the body length. The dorsal plate is ovate and broadly rounded posteriorly with no surface markings. The ventral plate is slightly narrower than the dorsal plate and is ovate. The lateral sulci are shallow and ill-defined. The posterior segment is large, rounded, and projects beyond the dorsal plate. The first foot joint is indistinct, the second joint is large and conical and does not project beyond the lorica. The toe, which is about two-sevenths of the body length, is stout and conical without a claw. The co-axial plates are broadly rounded.



Lecane (Monostyla) mawsoni n. sp. ventral view.

Total length 90 microns. Length of dorsal plate 62 microns. Length of ventral plate 70 microns. Width of dorsal plate 48 microns. Width of ventral plate 44 microns. Width of anterior dorsal margin 16 microns. Width of ventral margin 20 microns. Length of toe 20 microns.

Lecane mawsoni does not appear to be closely related to any of *Lecane* spp. but its nearest relative is probably *Lecane arcuata* from which it differs in both the anterior and posterior portions of the body, the deep V sinus, and the shape of the toe.

A type slide, No. 112, has been deposited at the Canterbury Museum, Christchurch, N.Z.

Lecane mawsoni has been named in honour of Sir Douglas Mawson, leader of the Expedition, and is the first *Lecane* sp. to be found in Antarctic waters.

LEPADELLA ACUMINATA (Ehrenberg).

Metopidia acuminata Ehrenberg, 1834. Abh. Akad. Wiss. Berlin, p. 210.

Station 56B (common). Station 54. Res. 62 (not common).

NOTES. Typical specimens having a body length of 100 microns, a width of 60-70 microns according to habitat, and with toes 20 microns in length.

LEPADELLA ELLIPTICA Wulfert.

Lepadella elliptica Wulfert, 1939. Arch. f. Hydrobiol., Bd. XXXV, p. 609.

Station 108 (not common).

NOTES. Dimensions. Body length 86 microns, maximum width 54 microns, length of toes 20 microns. The collar marking is in all cases heavy. The one variation is a slightly protruding ridge where the foot groove meets the posterior end of the body.

LEPADELLA PATELLA (Muller).

Brachionus patella Muller, 1786. Anim. Infus., p. 341.

Station 61, Coll. 953, 960. Station 82. Station 56B.

NOTES. Average dimensions of specimens: length of body 80 microns; length of toes 24 microns. There is considerable variation in the width and shape of the body, and its depth. The posterior edge of the plate is rounded in some specimens and in others is a bluntly rounded point. Many of these variations are considered to be due to the preservative as some specimens when changed from alcohol to water or glycerine-water showed a difference in the general outline of the body. For this reason the various variations shown are not recorded. *L. patella* was the dominant species in the habitats listed.

LOPHOCHARIS OXYSTERNON (Gosse).

Metopidia oxysternon Gosse, 1851. Ann. Mag. Nat. Hist., ser. 2, vol. 8, p. 201.

Station 61, Coll. 949 (rare).

NOTES. Length of body 84 microns. Maximum width 55 microns. Length of foot 26 microns. Length of toes 30 microns. With the exception that the specimens are smaller, and that there is a stippled girdle on the ventral surface joining the widest lateral points, the specimens examined are typical.

NOTOMMATA CYRTOPIUS Gosse.

Notommata cyrtopus Gosse, 1886. The Rotifera, vol. 2, p. 22.

Station 56B.

NOTES. Dimensions. Length of body 260 microns. Length of toes 16 microns. One specimen only was found. It agrees with the type except that the toes are shorter, the body length is less, and the trophi while similar are of greater relative length with a stronger fulcrum. The specimen was blackened and treatment with a bleach removed the ganglion and other organs. The animal undoubtedly belongs to this species.

TRICHOCERCA BIDENS (Lucks).

Diurella bidens Lucks, 1912. Westper. Bot-Zool. Varen. Voigt. "Die Radertiere Mitteleuropas", p. 331. Station 82 (rare).

NOTES. Length of body 110 microns. Length of toes 30 microns. Typical specimens. This was the only species of the genus *Trichocerca* found in the material.

DISCUSSION.

The rotifers are potentially cosmopolitan and the occurrence of these animals in a body of water does not depend upon its geographical position but on the ecological conditions prevailing of which hydrogen-ion content, and the temperature of the water are two factors. In many cases the same species will be found in lakes, marshes, and other waters throughout the world. The main problem of distribution then becomes transportation, and as the resting eggs of most rotifers are of small size with either an adhesive coating or spines, and are resistant to mechanical damage, or even immersion in weak acids or alkalis, they are easily carried by birds, wind, or in ships or aeroplanes. Two species of the Rotifera long thought endemic to Australia have been found on the West of the mountain ranges of New Zealand (Russell, 1954).

Whatever the means by which they were transported to the Antarctic the ploimate rotifers listed in this Report have evidently become established in the South. A majority of the ploimates reproduce by amixis, and it is apparent that in their new environment they must have become temperature tolerant to permit a life cycle long enough for the production of mictic females and males. The bdelloids have a wide temperature tolerance and can withstand desiccation, but apparently animals belonging to the genera *Lepadella* and *Colurella* as well as other ploimates can survive in colder waters than has been anticipated. In New Zealand *Colurella colurus* populations rapidly die at temperatures below 10° C., yet, as shown in this report, they must survive in very much colder waters in the Antarctic.

So far as the Rotatoria are concerned the Expedition's work has, for the first time, established the important fact that a wide range of ploimate rotifers exists in Antarctic waters, and that within the geographical limits from which collections were made the animals are well established and distributed. Subsequent collections in the Antarctic will probably show that the range of species is a very wide one.

The fact that none of the bdelloidal rotifers which were collected could be identified may call for some comment. The identification of the animals calls for an examination of their internal organs as well as external characteristics such as corona, foot, and toes. These details can be obtained only when the animals are alive, but in a few cases may be seen when the rotifers have been fixed in boiling water. The addition of any known anaesthetic, narcotic, or preserving medium, causes them to contract when they are worthless for study. Bartos (1951) gives an excellent description of the methods of treating bdelloidal rotifers, but no method has been devised that will prove satisfactory for expedition or field use and all bdelloids in field collections must, except in rare cases, be considered as a loss.

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17th June, 1958.

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Other Reports are in preparation.

